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Removal of dye from synthetic textile wastewater using agricultural wastes and determination of adsorption isotherm

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ABSTRACT

Reactive dyes have been applying extensively in textile industries. The treatment of textile industry waste waters is one of the main concerns of environmental health experts due to having excessive dyes and pollution. The aim of this study was to remove the Reactive Black 5 (RB5) dye from synthetic textile waste waters using agricultural wastes and determination of adsorption isotherm. In this research, *Glycyrrhiza glabra* root ash was prepared in laboratory condition and graded by standard sieve. The reactive Black 5 dye removals from textile synthetic wastewater using this adsorbent were tested. The effect of some parameters such as contact time (10–180 min), initial dye concentration (20, 40 and 60 mg/g) adsorbent dosage (0.2–2 g) and pH (2–12) were evaluated. Measurements were performed using an ultra violet-visible spectrophotometer at a wavelength of 597 nm and adsorption isotherm analyses were carried out. The results showed that data follow better the Langmuir adsorption model and the R_L = 0.1123 was in the range of 0 to 1. Adsorption efficiency was reduced with increasing initial dye concentration and decreasing the adsorbent dosage. According to the results, the remaining root as an agricultural waste showed proper efficiency economically for the removal of dyes from textile industry wastewater.

Keywords: Reactive dye; Adsorption isotherm; Agricultural waste; Synthetic; Textile industry

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